FIG.1

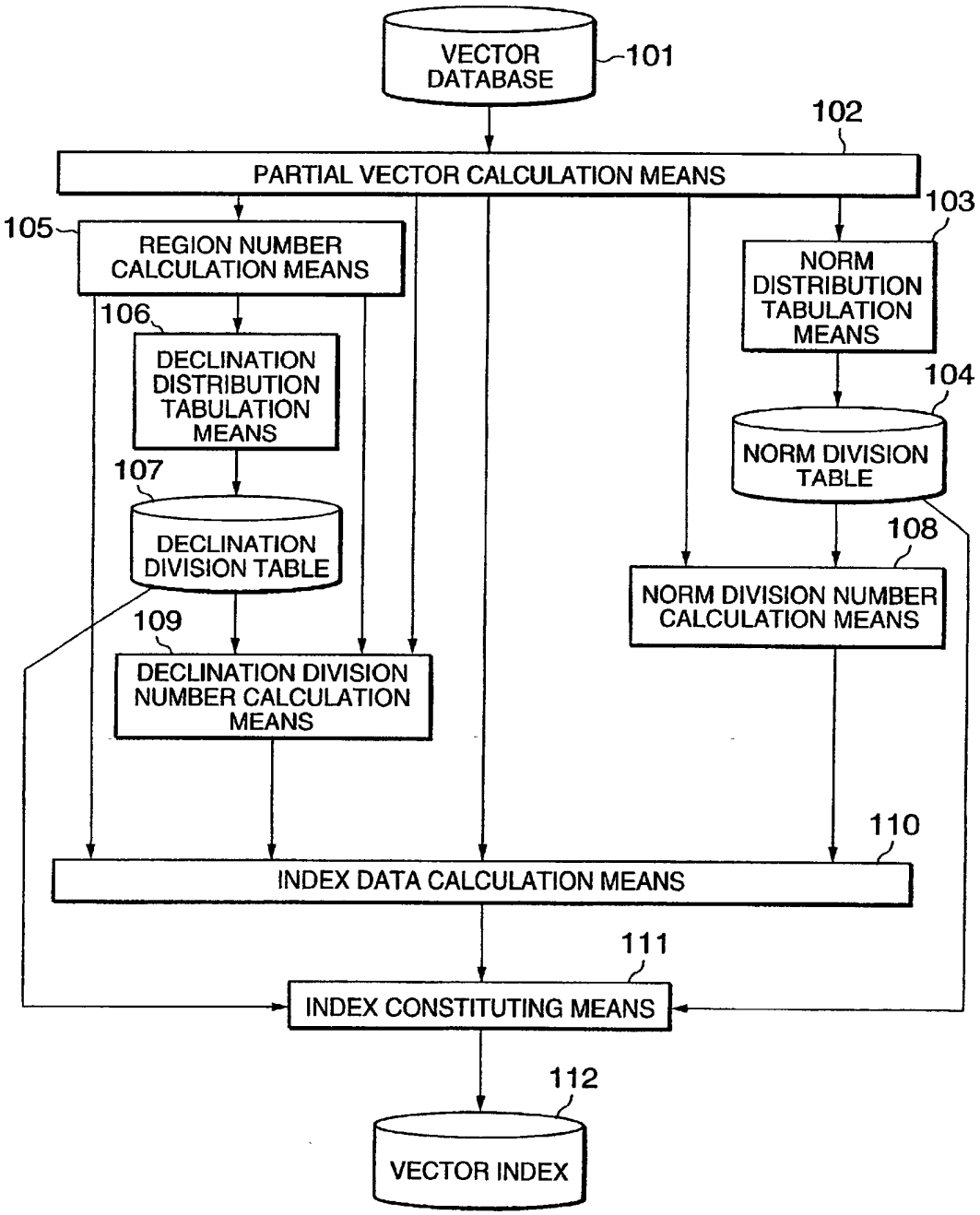
VECTOR DATABASE
101
102
PARTIAL VECTOR CALCULATION MEANS
103
105
REGION NUMBER CALCULATION MEANS
NORM DISTRIBUTION TABULATION MEANS
106
DECLINATION DISTRIBUTION TABULATION MEANS
104
NORM DIVISION TABLE
107
DECLINATION DIVISION TABLE
108
NORM DIVISION NUMBER CALCULATION MEANS
109
DECLINATION DIVISION NUMBER CALCULATION MEANS
110
INDEX DATA CALCULATION MEANS
111
INDEX CONSTITUTING MEANS
112
VECTOR INDEX

FIG.2

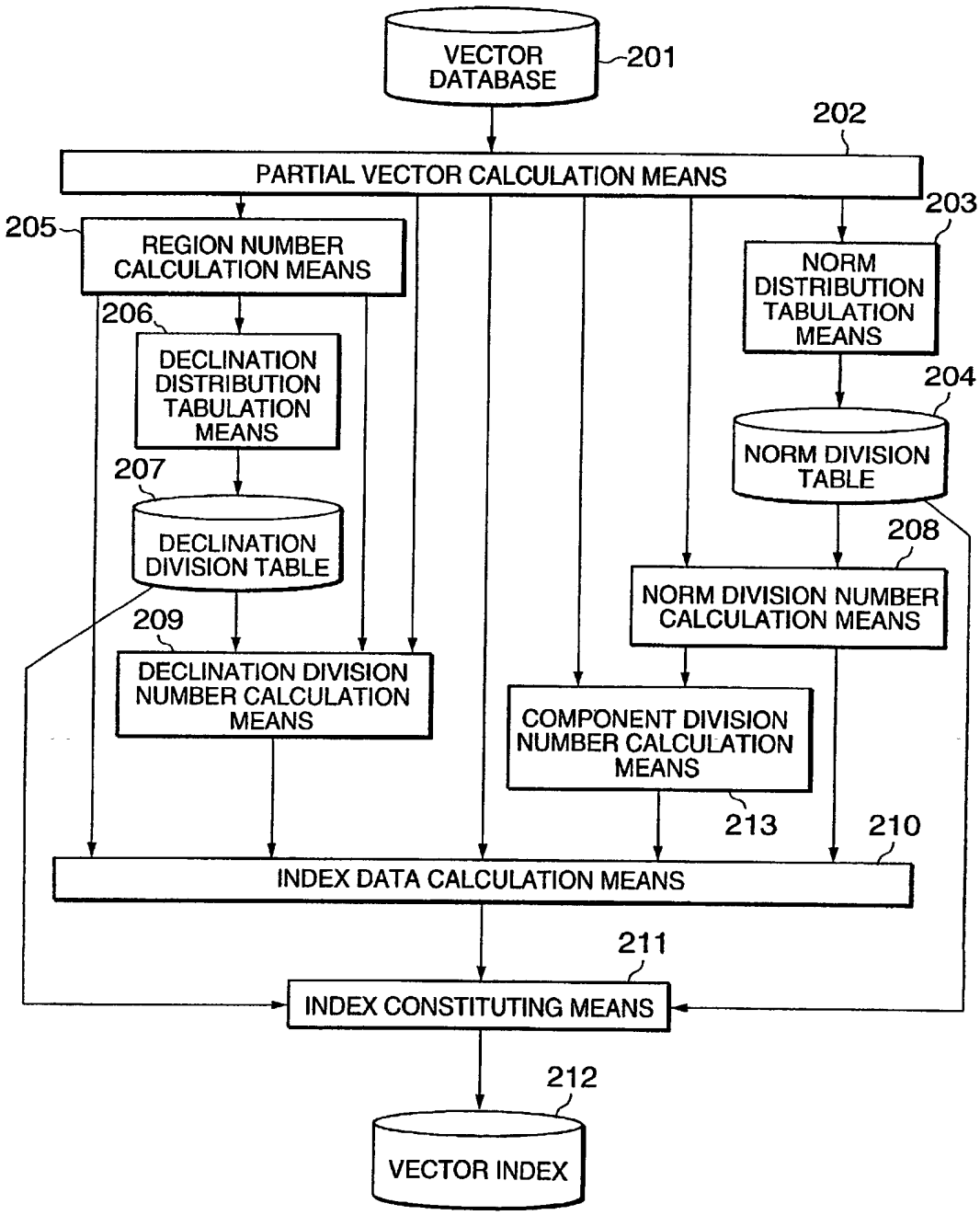
VECTOR DATABASE
201
202
PARTIAL VECTOR CALCULATION MEANS
203
205
REGION NUMBER CALCULATION MEANS
NORM DISTRIBUTION TABULATION MEANS
206
DECLINATION DISTRIBUTION TABULATION MEANS
204
NORM DIVISION TABLE
207
DECLINATION DIVISION TABLE
208
NORM DIVISION NUMBER CALCULATION MEANS
209
DECLINATION DIVISION NUMBER CALCULATION MEANS
COMPONENT DIVISION NUMBER CALCULATION MEANS
213
210
INDEX DATA CALCULATION MEANS
211
INDEX CONSTITUTING MEANS
212
VECTOR INDEX

FIG.3

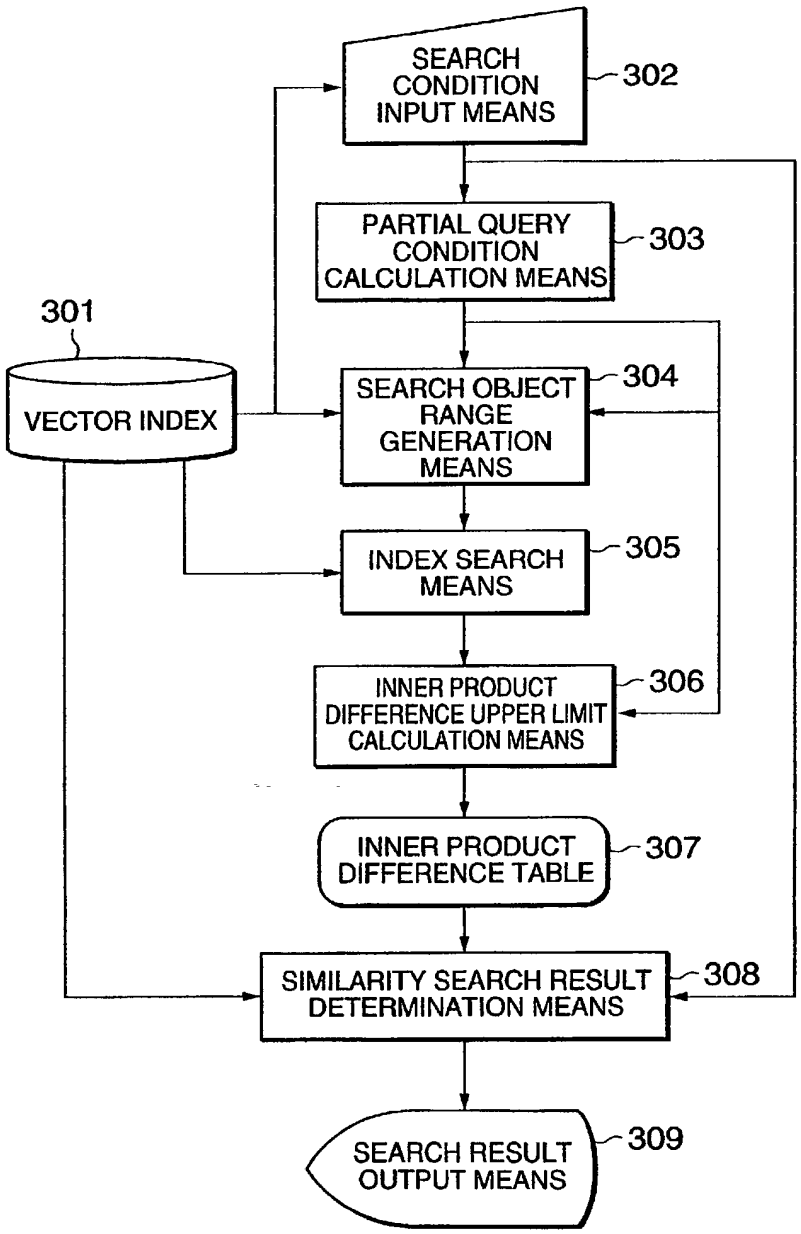
SEARCH CONDITION INPUT MEANS
302
PARTIAL QUERY CONDITION CALCULATION MEANS
303
301
VECTOR INDEX
SEARCH OBJECT RANGE GENERATION MEANS
304
INDEX SEARCH MEANS
305
INNER PRODUCT DIFFERENCE UPPER LIMIT CALCULATION MEANS
306
INNER PRODUCT DIFFERENCE TABLE
307
SIMILARITY SEARCH RESULT DETERMINATION MEANS
308
SEARCH RESULT OUTPUT MEANS
309

FIG.4

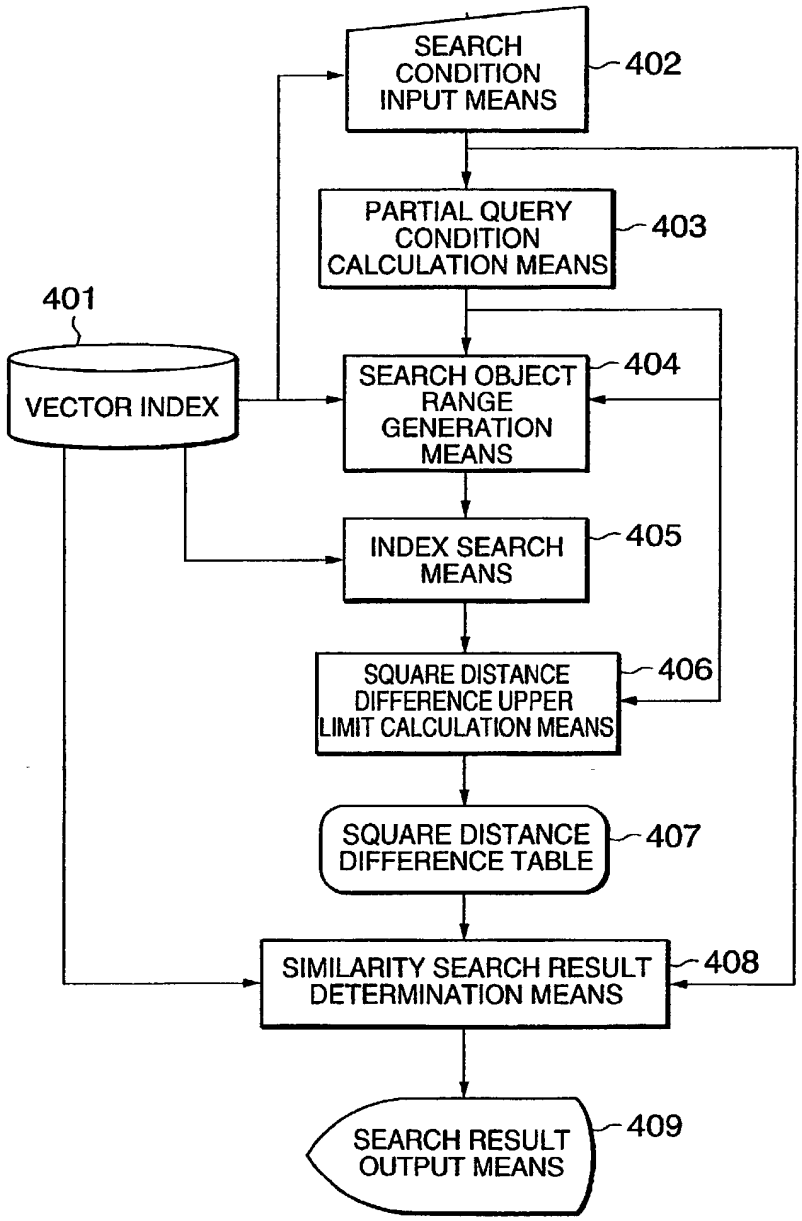
SEARCH CONDITION INPUT MEANS
402
PARTIAL QUERY CONDITION CALCULATION MEANS
403
401
VECTOR INDEX
SEARCH OBJECT RANGE GENERATION MEANS
404
INDEX SEARCH MEANS
405
SQUARE DISTANCE DIFFERENCE UPPER LIMIT CALCULATION MEANS
406
SQUARE DISTANCE DIFFERENCE TABLE
407
SIMILARITY SEARCH RESULT DETERMINATION MEANS
408
SEARCH RESULT OUTPUT MEANS
409

FIG.5A

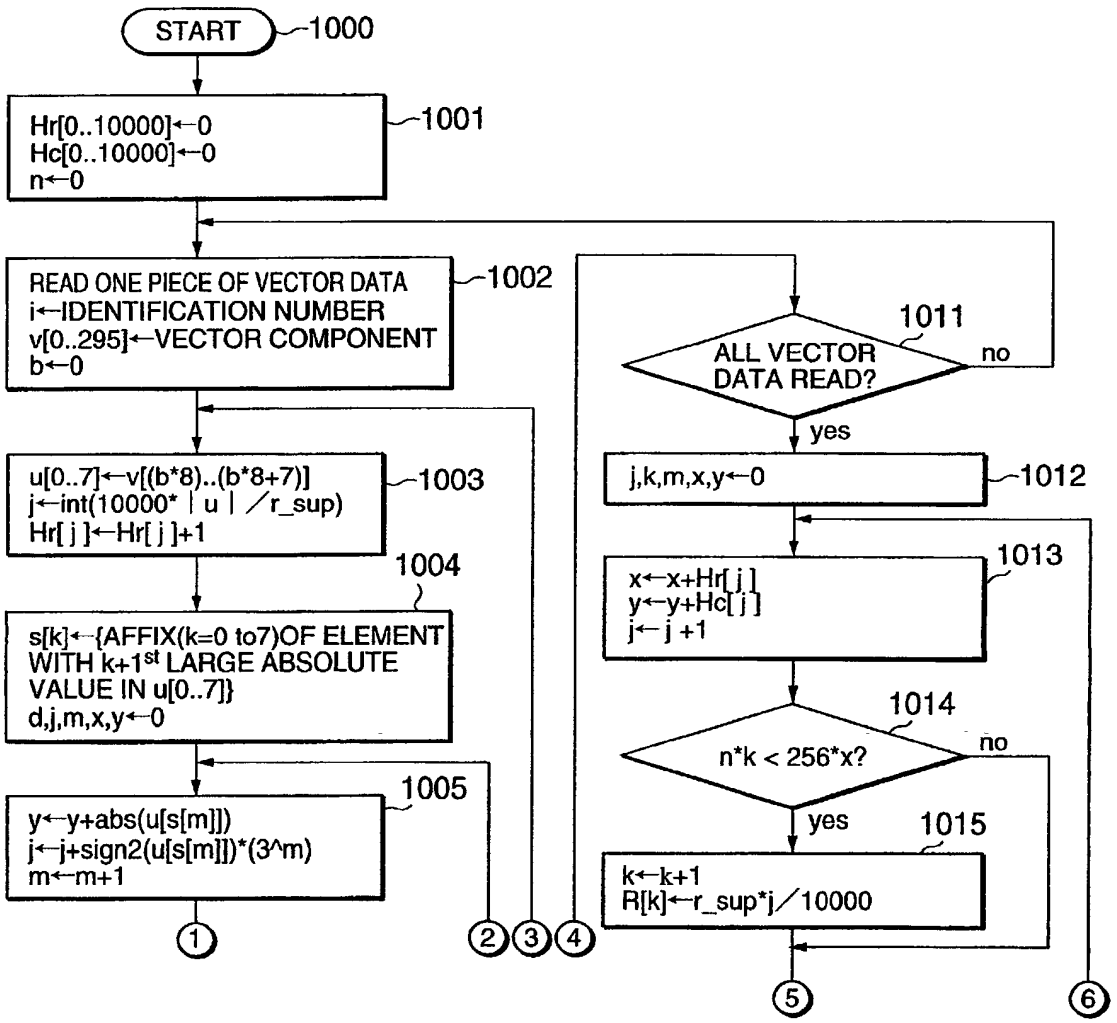
START
1000
Hr[0..10000]←0
Hc[0..10000]←0
n←0
1001
READ ONE PIECE OF VECTOR DATA
i←IDENTIFICATION NUMBER
v[0..295]←VECTOR COMPONENT
b←0
1002
u[0..7]←v[(b*8)..(b*8+7)]
j←int(10000* | u | /r_sup)
Hr[j]←Hr[j]+1
1003
1004
s[k]←{AFFIX(k=0 to7)OF ELEMENT WITH k+1st LARGE ABSOLUTE VALUE IN u[0..7]}
d,j,m,x,y←0
y←y+abs(u[s[m]])
j←j+sign2(u[s[m]])*(3^m)
m←m+1
1005
1
2
3
4
ALL VECTOR DATA READ?
1011
no
yes
j,k,m,x,y←0
1012
x←x+Hr[j]
y←y+Hc[j]
j← j +1
1013
n*k < 256*x?
1014
no
yes
k←k+1
R[k]←r_sup*j/10000
1015
5
6

FIG.5B

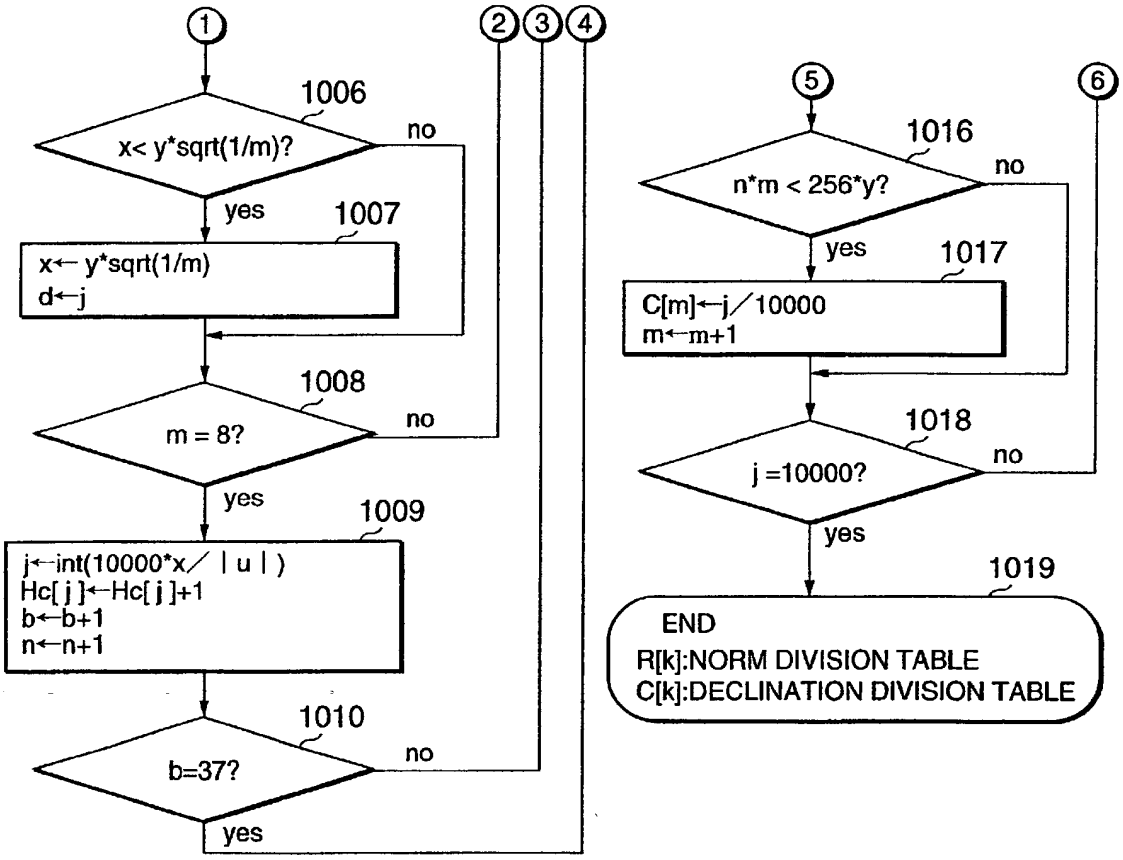
1
2
3
4
1006
x< y*sqrt(1/m)?
no
yes
1007
x← y*sqrt(1/m)
d←j
1008
m = 8?
no
yes
1009
j←int(10000*x/ | u |)
Hc[j]←Hc[j]+1
b←b+1
n←n+1
1010
b=37?
no
yes
5
6
1016
n*m < 256*y?
no
yes
1017
C[m]←j/10000
m←m+1
1018
j =10000?
no
yes
1019
END
R[k]:NORM DIVISION TABLE
C[k]:DECLINATION DIVISION TABLE

FIG.6A

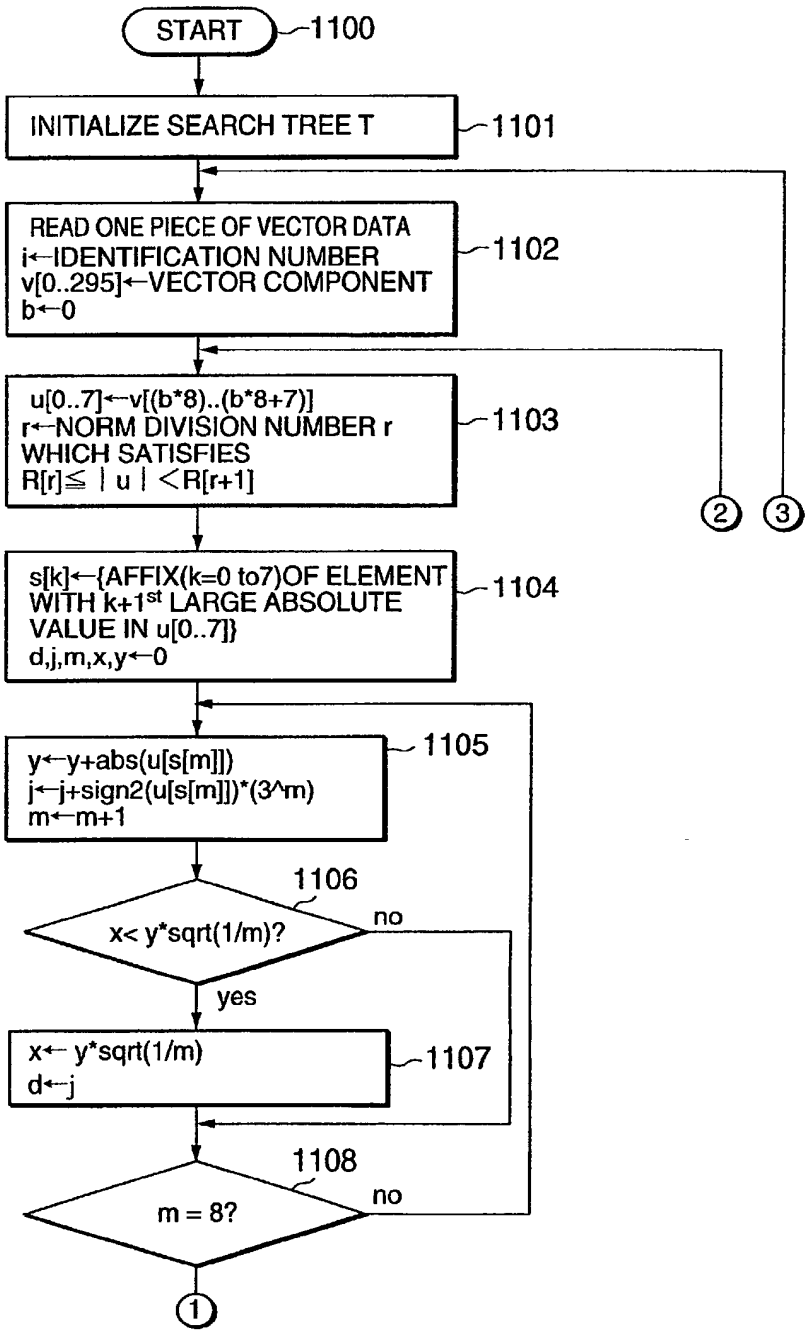
START
1100
INITIALIZE SEARCH TREE T
1101
READ ONE PIECE OF VECTOR DATA
i←IDENTIFICATION NUMBER
v[0..295]←VECTOR COMPONENT
b←0
1102
u[0..7]←v[(b*8)..(b*8+7)]
r←NORM DIVISION NUMBER r
WHICH SATISFIES
R[r]≦ | u | <R[r+1]
1103
2
3
s[k]←{AFFIX(k=0 to7)OF ELEMENT
WITH k+1st LARGE ABSOLUTE
VALUE IN u[0..7]}
d,j,m,x,y←0
1104
y←y+abs(u[s[m]])
j←j+sign2(u[s[m]])*(3^m)
m←m+1
1105
1106
x< y*sqrt(1/m)?
no
yes
x← y*sqrt(1/m)
d←j
1107
1108
m = 8?
no
1

FIG.6B

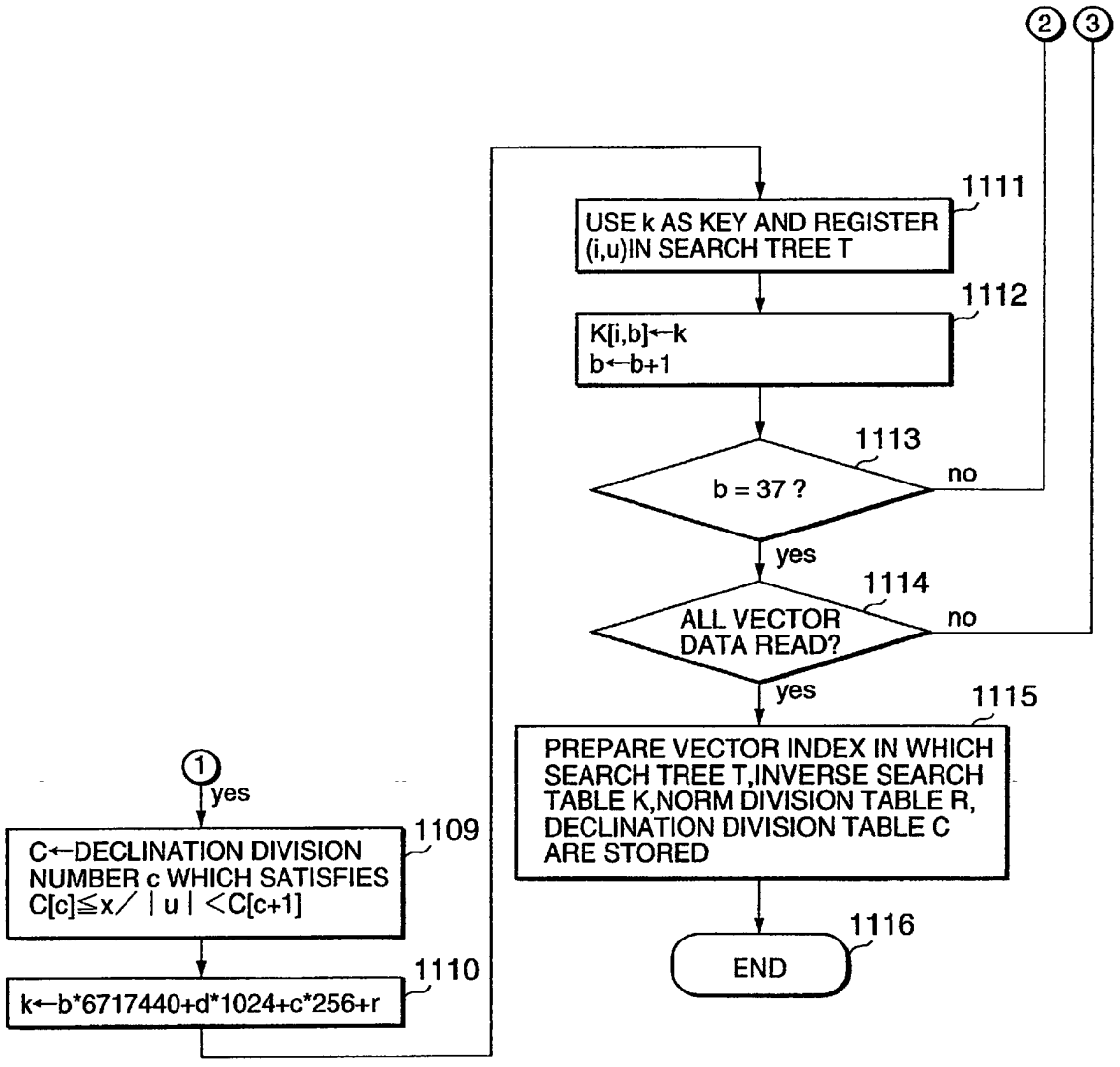
2
3
1111
USE k AS KEY AND REGISTER (i,u)IN SEARCH TREE T
1112
K[i,b]←k
b←b+1
1113
b = 37 ?
no
yes
1114
ALL VECTOR DATA READ?
no
yes
1115
PREPARE VECTOR INDEX IN WHICH SEARCH TREE T,INVERSE SEARCH TABLE K,NORM DIVISION TABLE R, DECLINATION DIVISION TABLE C ARE STORED
1116
END
1
yes
1109
C←DECLINATION DIVISION NUMBER c WHICH SATISFIES C[c]≦x/ | u | <C[c+1]
1110
k←b*6717440+d*1024+c*256+r

FIG.7A

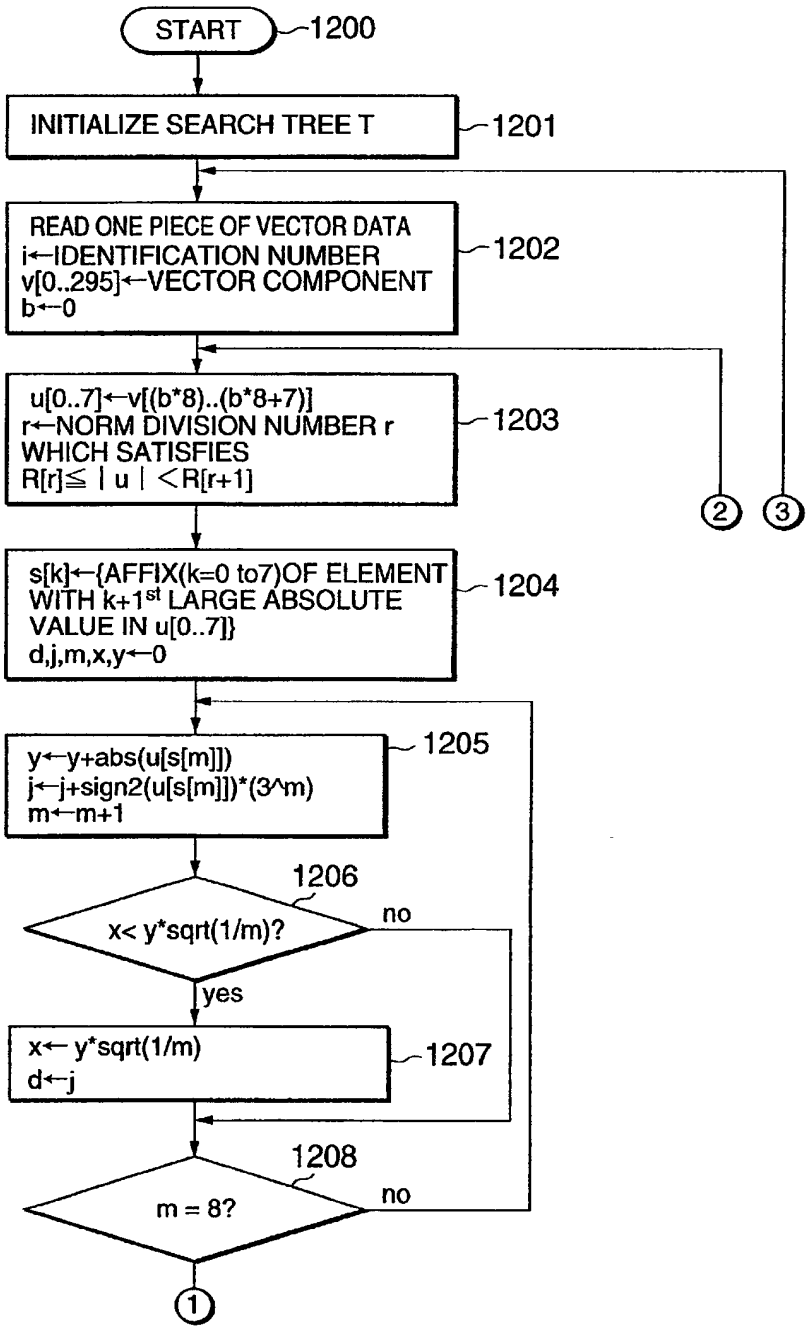
START
1200
INITIALIZE SEARCH TREE T
1201
READ ONE PIECE OF VECTOR DATA
i←IDENTIFICATION NUMBER
v[0..295]←VECTOR COMPONENT
b←0
1202
u[0..7]←v[(b*8)..(b*8+7)]
r←NORM DIVISION NUMBER r
WHICH SATISFIES
R[r]≦ | u | <R[r+1]
1203
2
3
s[k]←{AFFIX(k=0 to7)OF ELEMENT
WITH k+1st LARGE ABSOLUTE
VALUE IN u[0..7]}
d,j,m,x,y←0
1204
y←y+abs(u[s[m]])
j←j+sign2(u[s[m]])*(3^m)
m←m+1
1205
1206
x< y*sqrt(1/m)?
no
yes
x← y*sqrt(1/m)
d←j
1207
1208
m = 8?
no
1

FIG.7B

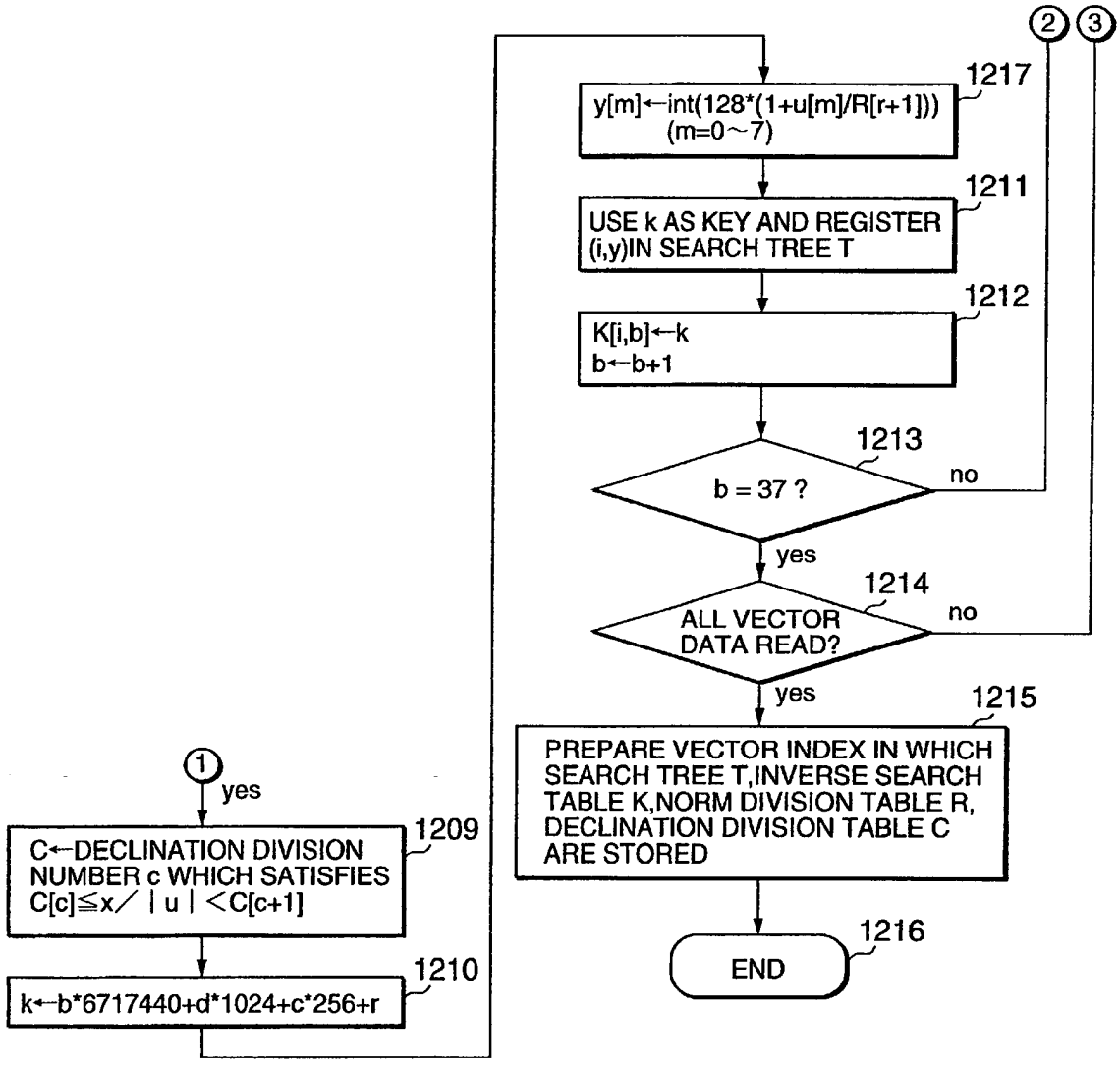
1217
y[m]←int(128*(1+u[m]/R[r+1]))
(m=0～7)
1211
USE k AS KEY AND REGISTER
(i,y)IN SEARCH TREE T
1212
K[i,b]←k
b←b+1
1213
b = 37 ?
no
yes
1214
ALL VECTOR
DATA READ?
no
yes
1215
PREPARE VECTOR INDEX IN WHICH
SEARCH TREE T,INVERSE SEARCH
TABLE K,NORM DIVISION TABLE R,
DECLINATION DIVISION TABLE C
ARE STORED
1216
END
2
3
1
yes
C←DECLINATION DIVISION
NUMBER c WHICH SATISFIES
C[c]≦x／｜u｜＜C[c+1]
1209
k←b*6717440+d*1024+c*256+r
1210

FIG.8A

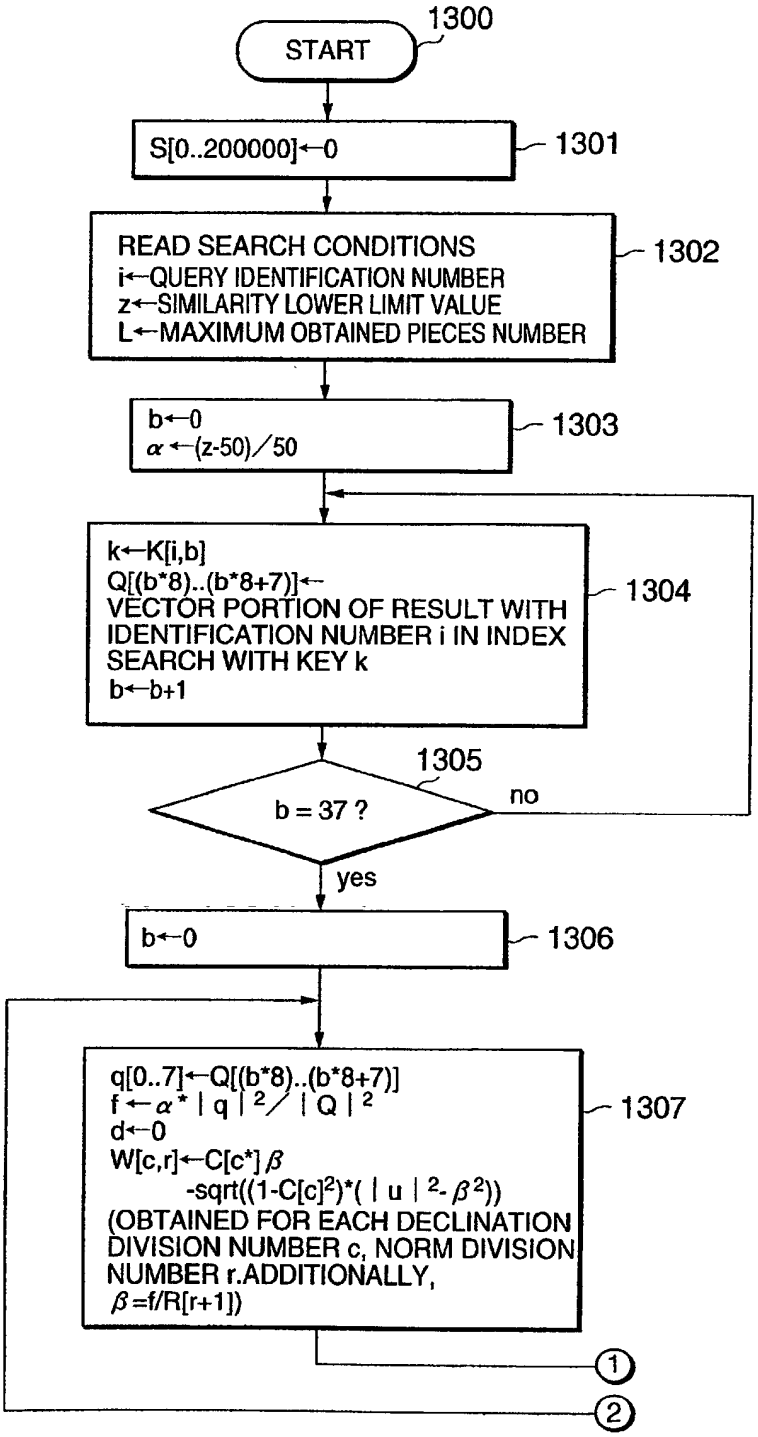
1300
START
S[0..200000]←0
1301
READ SEARCH CONDITIONS
i←QUERY IDENTIFICATION NUMBER
z←SIMILARITY LOWER LIMIT VALUE
L←MAXIMUM OBTAINED PIECES NUMBER
1302
b←0
α←(z-50)/50
1303
k←K[i,b]
Q[(b*8)..(b*8+7)]←
VECTOR PORTION OF RESULT WITH IDENTIFICATION NUMBER i IN INDEX SEARCH WITH KEY k
b←b+1
1304
1305
b = 37 ?
no
yes
b←0
1306
q[0..7]←Q[(b*8)..(b*8+7)]
f←α* | q |²/ | Q |²
d←0
W[c,r]←C[c*]β
-sqrt((1-C[c]²)*(| u |²-β²))
(OBTAINED FOR EACH DECLINATION DIVISION NUMBER c, NORM DIVISION NUMBER r.ADDITIONALLY, β=f/R[r+1])
1307
①
②

FIG.8B

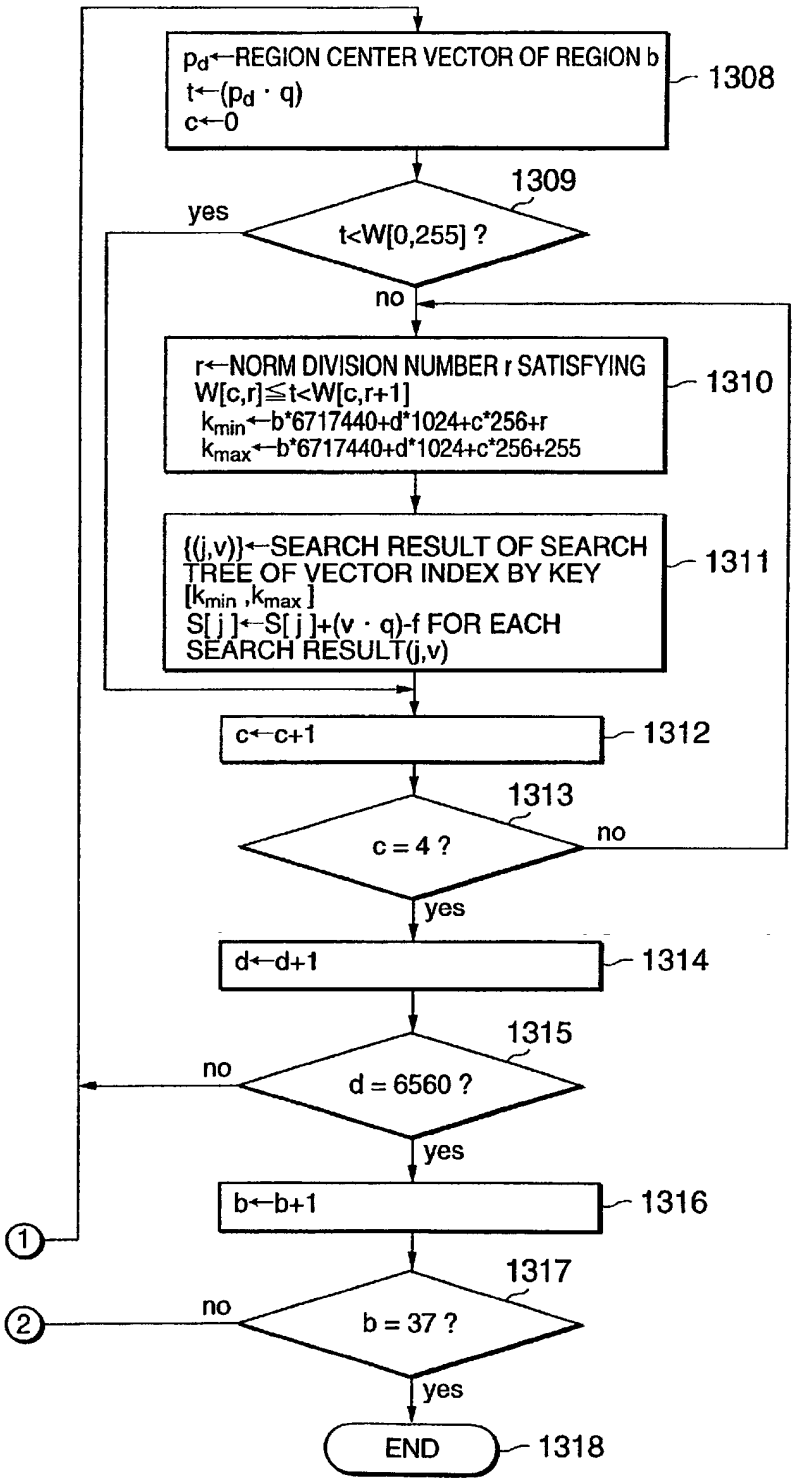
p_d←REGION CENTER VECTOR OF REGION b
t←(p_d · q)
c←0
1308
1309
yes
t<W[0,255] ?
no
r←NORM DIVISION NUMBER r SATISFYING W[c,r]≦t<W[c,r+1]
k_{min}←b*6717440+d*1024+c*256+r
k_{max}←b*6717440+d*1024+c*256+255
1310
{(j,v)}←SEARCH RESULT OF SEARCH TREE OF VECTOR INDEX BY KEY [k_{min} ,k_{max}]
S[j]←S[j]+(v · q)-f FOR EACH SEARCH RESULT(j,v)
1311
c←c+1
1312
1313
c = 4 ?
no
yes
d←d+1
1314
1315
no
d = 6560 ?
yes
b←b+1
1316
1317
no
b = 37 ?
yes
END
1318
①
②

FIG.9

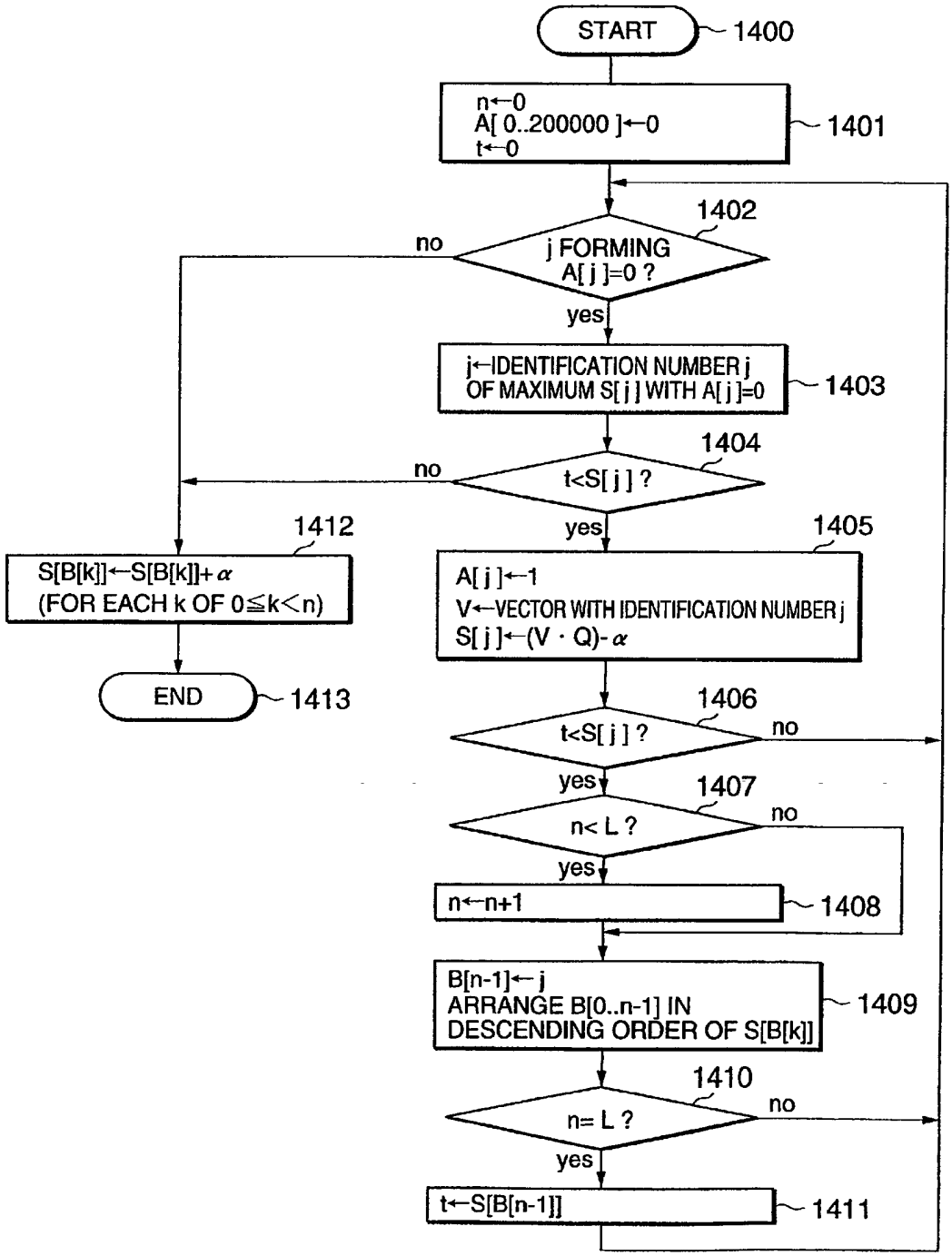
START
1400
n←0
A[0..200000]←0
t←0
1401
1402
j FORMING
A[j]=0 ?
no
yes
j←IDENTIFICATION NUMBER j
OF MAXIMUM S[j] WITH A[j]=0
1403
1404
t<S[j] ?
no
yes
1405
A[j]←1
V←VECTOR WITH IDENTIFICATION NUMBER j
S[j]←(V · Q)-α
1406
t<S[j] ?
no
yes
1407
n< L ?
no
yes
n←n+1
1408
B[n-1]← j
ARRANGE B[0..n-1] IN
DESCENDING ORDER OF S[B[k]]
1409
1410
n= L ?
no
yes
t←S[B[n-1]]
1411
1412
S[B[k]]←S[B[k]]+α
(FOR EACH k OF 0≦k<n)
END
1413

FIG.10A

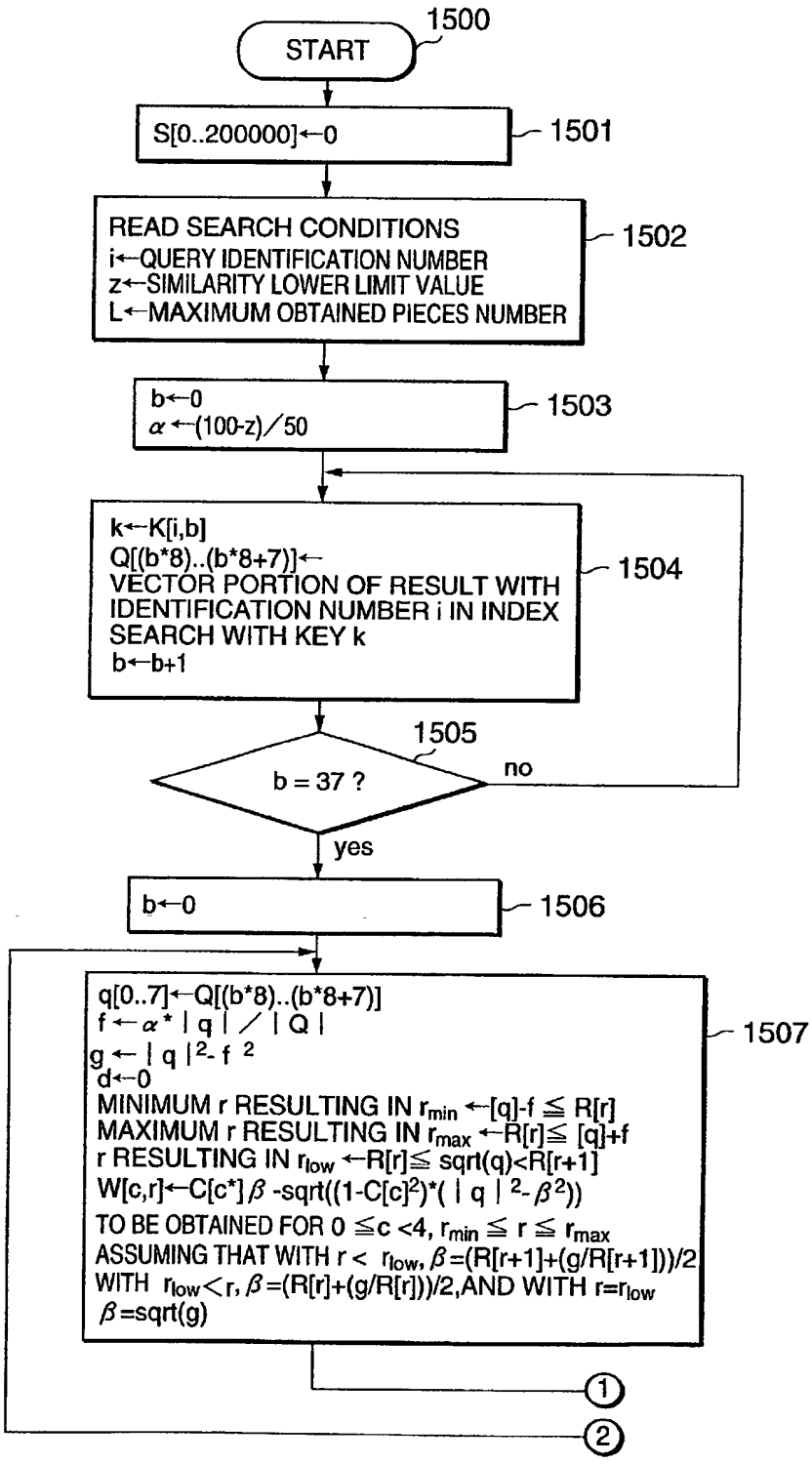
START
1500
S[0..200000]←0
1501
READ SEARCH CONDITIONS
i←QUERY IDENTIFICATION NUMBER
z←SIMILARITY LOWER LIMIT VALUE
L←MAXIMUM OBTAINED PIECES NUMBER
1502
b←0
α←(100-z)/50
1503
k←K[i,b]
Q[(b*8)..(b*8+7)]←
VECTOR PORTION OF RESULT WITH IDENTIFICATION NUMBER i IN INDEX SEARCH WITH KEY k
b←b+1
1504
1505
b = 37 ?
no
yes
b←0
1506
q[0..7]←Q[(b*8)..(b*8+7)]
f←α* | q | / | Q |
g←| q |2- f 2
d←0
MINIMUM r RESULTING IN rmin ←[q]-f ≦ R[r]
MAXIMUM r RESULTING IN rmax ←R[r]≦ [q]+f
r RESULTING IN rlow ←R[r]≦ sqrt(q)<R[r+1]
W[c,r]←C[c*]β -sqrt((1-C[c]2)*(| q | 2- β2))
TO BE OBTAINED FOR 0 ≦c <4, rmin ≦ r ≦ rmax
ASSUMING THAT WITH r < rlow, β=(R[r+1]+(g/R[r+1]))/2
WITH rlow<r, β=(R[r]+(g/R[r]))/2,AND WITH r=rlow
β=sqrt(g)
1507
1
2

FIG.10B

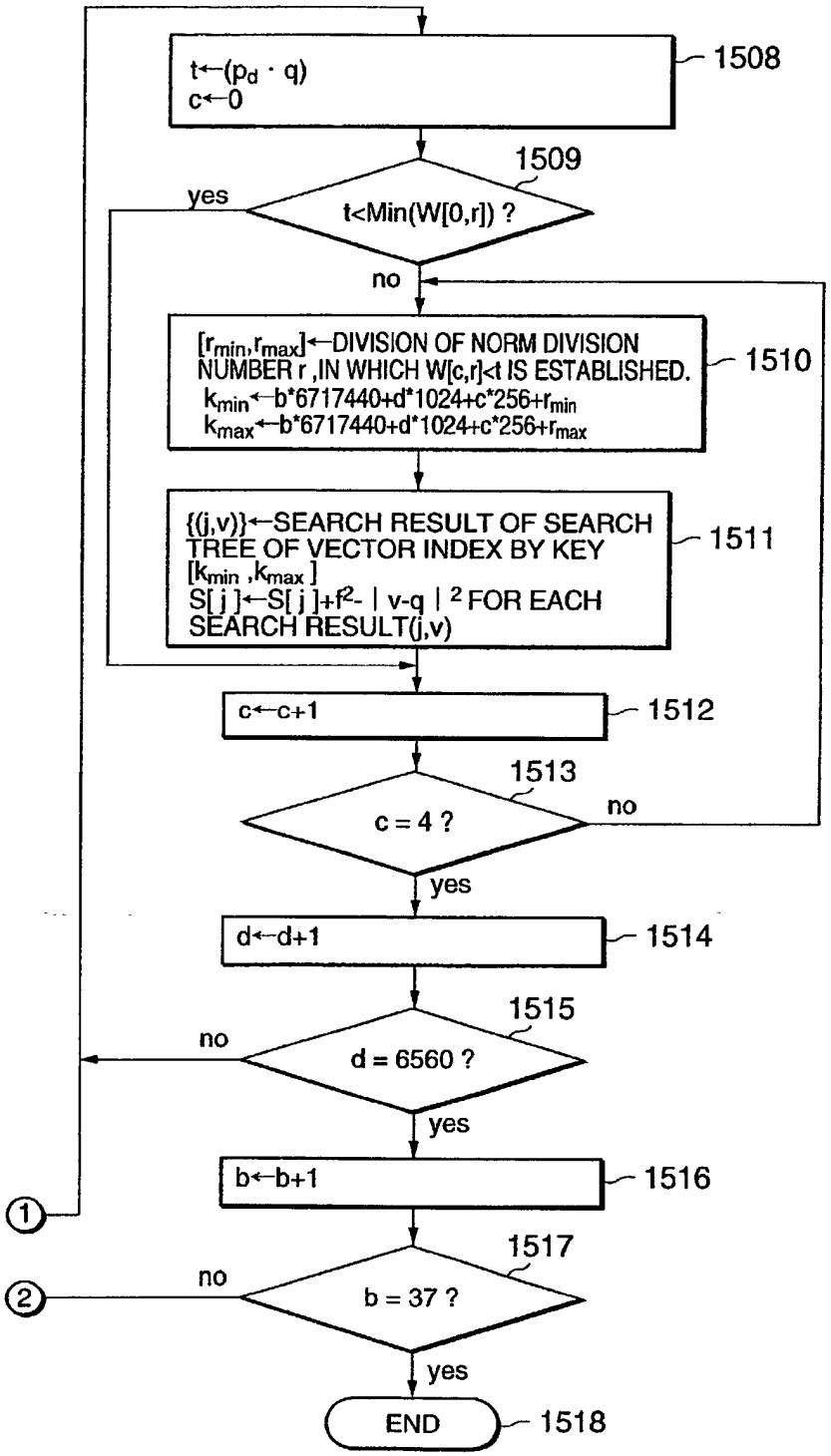
t←(pd · q)
c←0
1508
1509
yes
t<Min(W[0,r]) ?
no
[rmin,rmax]←DIVISION OF NORM DIVISION NUMBER r ,IN WHICH W[c,r]<t IS ESTABLISHED.
kmin←b*6717440+d*1024+c*256+rmin
kmax←b*6717440+d*1024+c*256+rmax
1510
{(j,v)}←SEARCH RESULT OF SEARCH TREE OF VECTOR INDEX BY KEY [kmin ,kmax]
S[j]←S[j]+f2- | v-q | 2 FOR EACH SEARCH RESULT(j,v)
1511
c←c+1
1512
1513
c = 4 ?
no
yes
d←d+1
1514
1515
no
d = 6560 ?
yes
b←b+1
1516
1517
no
b = 37 ?
yes
END
1518
1
2

FIG.11A

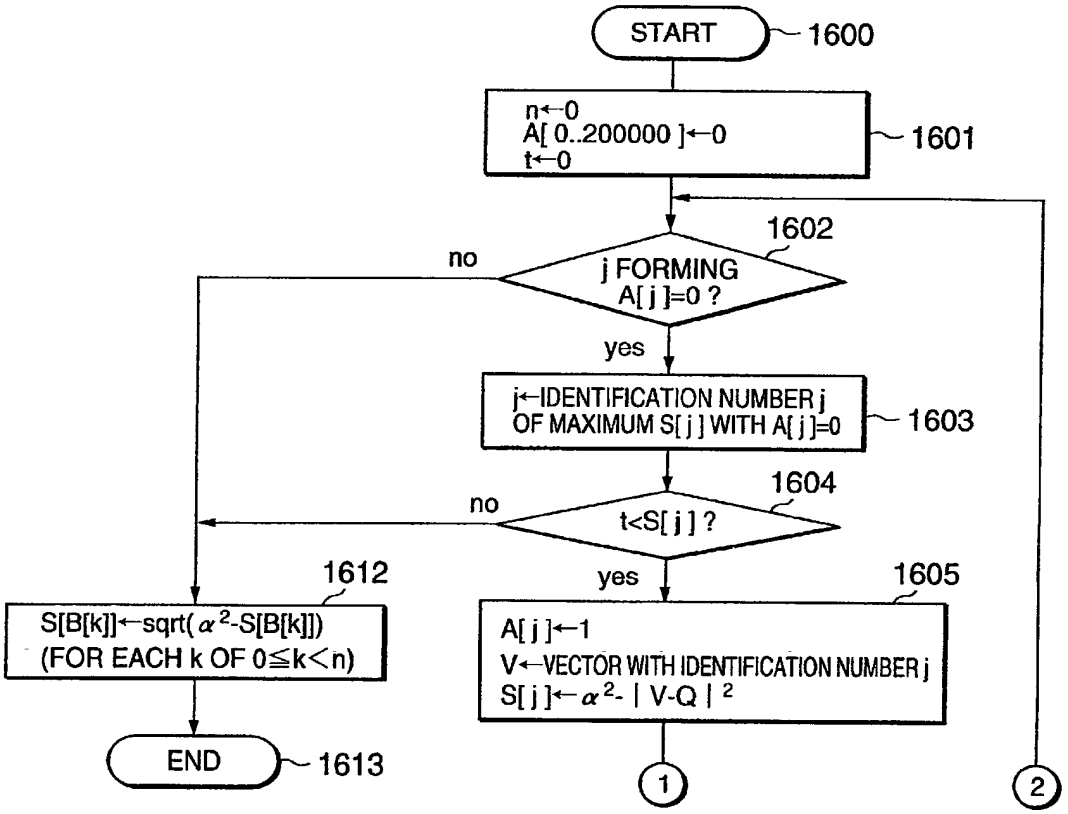
START
1600
n←0
A[0..200000]←0
t←0
1601
1602
j FORMING
A[j]=0 ?
no
yes
j←IDENTIFICATION NUMBER j
OF MAXIMUM S[j] WITH A[j]=0
1603
1604
t<S[j] ?
no
yes
1612
S[B[k]]←sqrt(α 2-S[B[k]])
(FOR EACH k OF 0≦k<n)
1605
A[j]←1
V←VECTOR WITH IDENTIFICATION NUMBER j
S[j]← α 2- | V-Q | 2
END
1613
1
2

FIG.11B

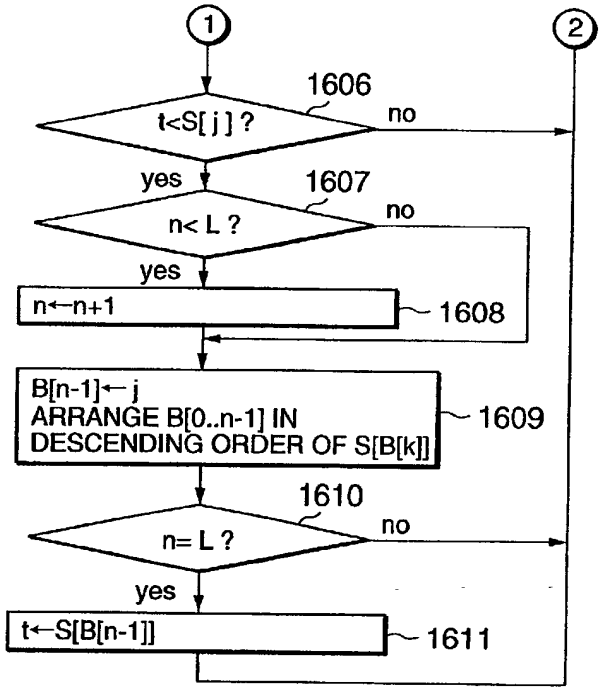
1
2
1606
t<S[j] ?
no
yes
1607
n< L ?
no
yes
n←n+1
1608
B[n-1]← j
ARRANGE B[0..n-1] IN
DESCENDING ORDER OF S[B[k]]
1609
1610
n= L ?
no
yes
t←S[B[n-1]]
1611

FIG. 12A

```
1 +0.029259 -0.016005 -0.021118 +0.024992 -0.006860 -0.009032 -0.007255 -0.007715 -0.025648 +0.016061
  -0.060584 -0.013593 -0.020985 -0.112403 -0.012045 +0.044741 +0.026761 +0.078339 +0.048166 +0.043434
  +0.100093 +0.009913 +0.085770 +0.101257 +0.072163 -0.066112 +0.059376 -0.020159 +0.051960 -0.129138
  -0.028065 +0.027535 +0.028316 +0.050490 +0.015931 -0.040316 -0.013109 -0.014728 -0.004639 -0.021525
  -0.000471 -0.033506 +0.013866 -0.054646 +0.067350 +0.042063 +0.041963 -0.006444 -0.092581 +0.004488
  +0.004741 +0.009351 +0.038429 -0.042254 -0.027641 -0.068727 +0.037185 -0.003393 -0.040649 +0.013169
  +0.020619 +0.025594 -0.019990 -0.117804 +0.005791 -0.027860 +0.000220 -0.038765 -0.029964 +0.020038
  +0.032435 -0.027518 -0.063942 +0.085381 +0.038776 +0.051395 +0.004047 +0.092011 -0.076222 +0.096729
  -0.018331 +0.115754 -0.038478 +0.131147 -0.074560 +0.080634 -0.186932 +0.024004 +0.047046 -0.075571
  +0.121789 -0.055221 -0.001166 -0.053469 -0.086326 +0.011837 -0.060801 +0.222437 -0.055550 -0.117881
  -0.020700 -0.028172 -0.121642 -0.160389 +0.147645 -0.037681 -0.057998 +0.104025 +0.251415 -0.029438
  +0.030504 -0.048312 -0.072984 -0.088780 +0.041684 +0.127138 +0.061804 +0.064147 -0.016586 +0.024305
  +0.060558 -0.004070 +0.094040 -0.011500 +0.000545 +0.083231 +0.016565 +0.081034 +0.073438 -0.006857
  -0.008995 +0.023537 +0.066849 -0.035310 +0.005572 -0.015236 +0.109983 -0.185597 +0.016643 +0.032632
  -0.075726 -0.110307 +0.038577 +0.038475 -0.042287 +0.082878 +0.035997 -0.009888 +0.081286 +0.063583
  -0.041429 +0.025969 -0.040406 +0.005639 +0.032087 +0.007947 +0.041689 +0.040077 +0.067726 -0.101670
  -0.091183 +0.167914 -0.080320 +0.049351 +0.069409 +0.063139 -0.038358 -0.126212 +0.058109 +0.031847
  -0.014998 -0.022995 +0.054876 +0.033124 -0.065283 -0.058574 +0.049729 -0.046552 +0.042485 -0.006179
  -0.058764 +0.079383 +0.000817 -0.001482 -0.036410 -0.036097 -0.045920 -0.001729 +0.039971 +0.083165
  -0.023112 +0.014492 +0.028403 +0.047480 +0.038502 +0.028348 +0.055128 +0.045340 -0.066148 +0.018156
  -0.008535 -0.042836 +0.006119 -0.037691 +0.018055 +0.035741 -0.023394 +0.012401 -0.070880 +0.010066
  -0.013264 -0.031192 -0.064061 -0.026757 -0.028246 +0.078634 +0.013295 +0.011129 +0.028807 +0.012339
  +0.007173 -0.008856 +0.040397 +0.039853 +0.085247 -0.053102 +0.052307 +0.065223 +0.116747 +0.013464
  -0.004875 +0.019186 +0.024114 -0.056101 -0.024008 +0.061251 -0.043466 -0.017640 +0.081001 -0.014824
  -0.003836 +0.059081 +0.051690 -0.032798 +0.039059 +0.020370 +0.015096 +0.051693 +0.015507 -0.041601
  -0.000192 -0.065087 +0.018487 -0.040415 +0.036173 -0.011809 +0.010862 +0.005944 +0.028534 -0.031335
  +0.023075 +0.033037 +0.063589 +0.014185 +0.006539 +0.002593 -0.023986 -0.038277 -0.009555 -0.018987
  +0.052526 +0.035448 +0.013042 +0.023662 +0.011775 -0.055742 -0.008120 -0.040546 -0.023508 -0.069309
  +0.037886 +0.041494 -0.038487 -0.035241 +0.020432 -0.008060 +0.002984 +0.070241 +0.069379 +0.020206
  +0.032996 +0.047815 +0.046106 +0.001794 +0.035342 -0.003895
```

FIG. 12B

```
2 +0.028972 -0.012757 -0.015597 +0.019727 +0.009386 -0.016593 +0.003627 +0.006288 -0.019184 +0.020306
  -0.057163 -0.017815 -0.026345 -0.102036 +0.002587 +0.037785 +0.029168 +0.076061 +0.043901 +0.040040
  +0.123462 +0.001139 +0.085437 +0.108889 +0.052652 -0.048914 +0.060612 -0.005019 +0.030421 -0.153633
  -0.041444 +0.038908 +0.006823 +0.069954 +0.028216 -0.043207 -0.030092 +0.013753 +0.023770 -0.018313
  +0.008825 -0.036443 +0.001076 -0.067721 +0.046034 +0.030717 +0.017880 -0.036936 -0.093124 -0.000883
  +0.027865 +0.007906 +0.005978 -0.024367 -0.012682 -0.054200 +0.025934 +0.000926 -0.047710 +0.009757
  +0.005940 +0.020855 -0.070890 -0.113381 +0.004988 -0.038150 -0.000456 -0.024836 -0.007560 +0.025912
  +0.009004 -0.053047 -0.079142 +0.085440 +0.027876 +0.051104 +0.016944 +0.082277 -0.071359 +0.107308
  +0.005041 +0.112418 -0.009138 +0.119492 -0.069016 +0.123591 -0.166734 +0.032382 +0.005430 -0.030192
  +0.116327 -0.077304 +0.003280 -0.006984 -0.055858 +0.022018 -0.110375 +0.197565 -0.038060 -0.085170
  -0.065823 -0.021350 -0.104387 -0.147696 +0.111377 -0.028678 -0.097095 +0.064212 +0.255376 -0.011000
  +0.020901 -0.032671 -0.092765 -0.063843 +0.008917 +0.106446 +0.070094 +0.078741 -0.012886 -0.003581
  +0.069363 +0.021164 +0.046900 -0.021002 -0.008879 +0.052981 +0.006370 +0.081378 +0.054328 -0.006424
  -0.006277 +0.013635 +0.117156 -0.037470 +0.014036 -0.048765 +0.093100 -0.147319 +0.028556 -0.017833
  -0.070005 -0.123845 +0.013978 +0.006964 -0.047420 +0.100905 -0.019278 -0.009641 +0.057287 +0.058665
  -0.063796 +0.019097 -0.045014 -0.036129 +0.022014 +0.071405 +0.028573 +0.046653 +0.063911 -0.048555
  -0.070203 +0.205558 -0.051782 +0.102727 +0.042066 +0.028359 -0.021939 -0.082837 +0.064817 +0.017215
  -0.042670 -0.031901 +0.037475 +0.055012 -0.012237 -0.067371 +0.072587 -0.009949 +0.053991 +0.019722
  -0.035742 +0.081726 +0.019732 +0.013624 -0.031871 -0.009025 -0.064237 +0.002162 +0.014326 +0.103617
  -0.048376 +0.034422 -0.019797 +0.041018 +0.089878 +0.072000 +0.030657 +0.040709 -0.071603 +0.005629
    .
    .
    .
```

FIG. 13

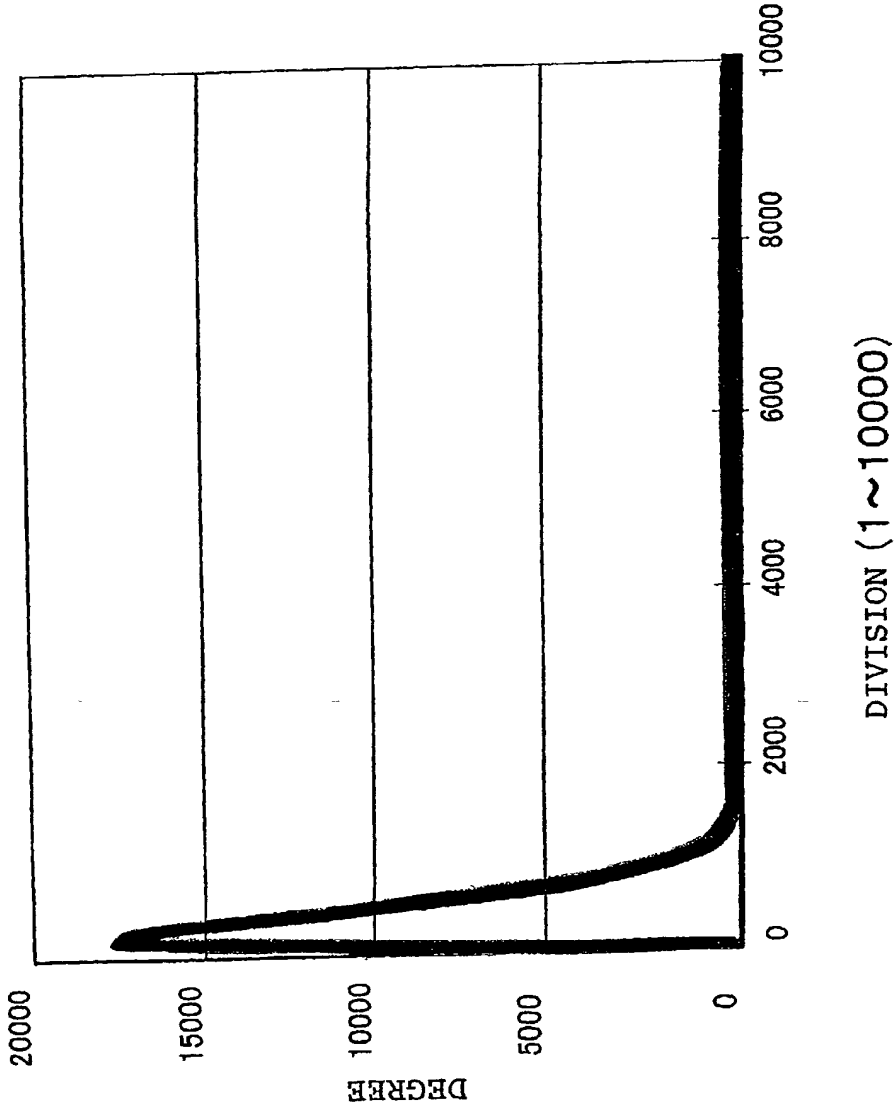
EXAMPLE OF NORM DISTRIBUTION
DEGREE
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
DIVISION (1~10000)

FIG. 14

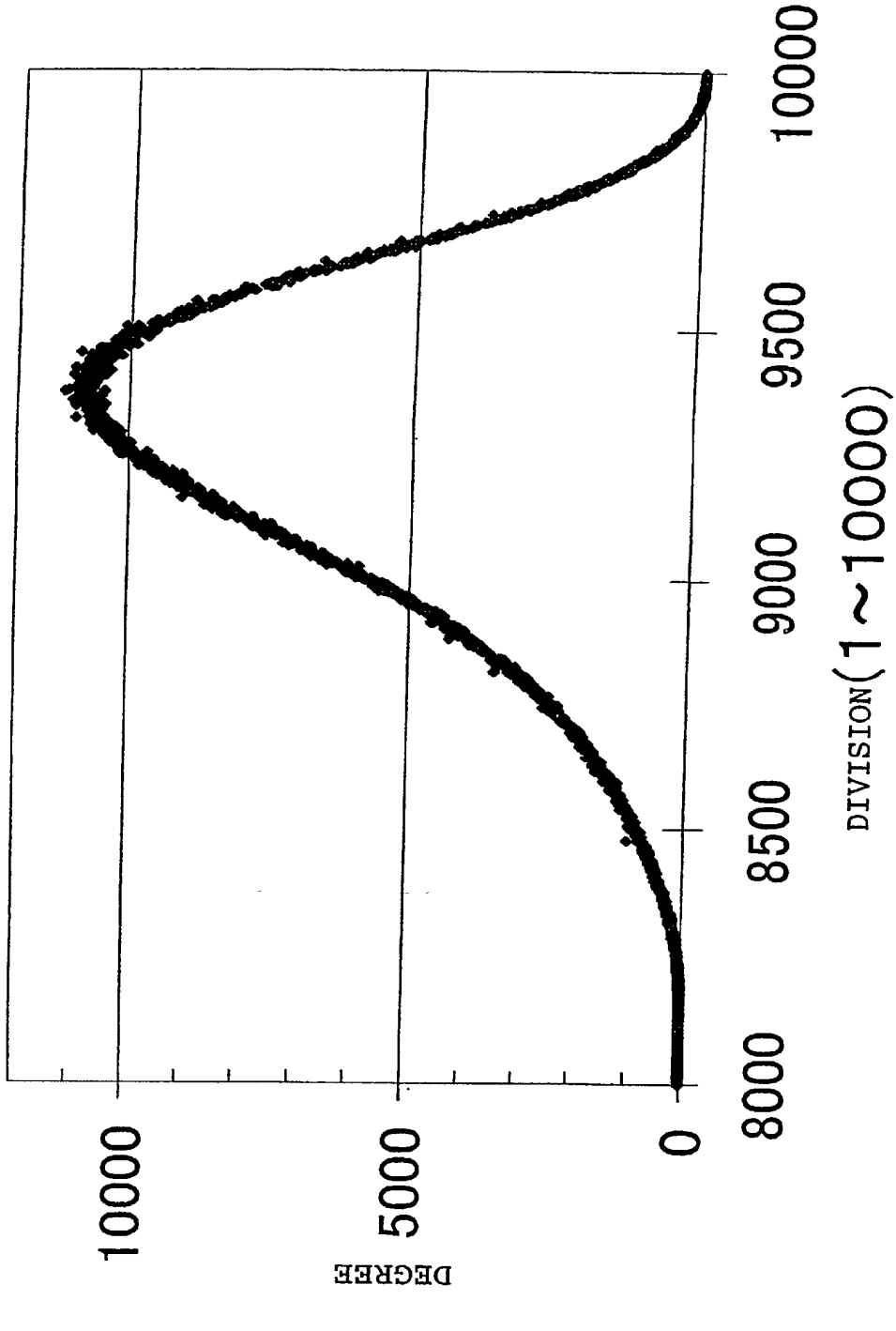
EXAMPLE OF DECLINATION DISTRIBUTION
10000
5000
0
DEGREE
8000
8500
9000
9500
10000
DIVISION(1~10000)

FIG. 15A

EXAMPLE OF NORM DIVISION TABLE (256 DIVISIONS)

	0	1	2	3	4	5	6	7	8	9
0	0.00000	0.03320	0.04112	0.04617	0.04999	0.05354	0.05687	0.05940	0.06182	0.06416
10	0.06585	0.06805	0.06965	0.07121	0.07275	0.07425	0.07572	0.07716	0.07858	0.07951
20	0.08088	0.08178	0.08312	0.08400	0.08530	0.08616	0.08701	0.08827	0.08910	0.08992
30	0.09073	0.09194	0.09273	0.09352	0.09431	0.09508	0.09585	0.09662	0.09737	0.09813
40	0.09887	0.09961	0.10035	0.10108	0.10180	0.10252	0.10324	0.10395	0.10465	0.10535
50	0.10605	0.10639	0.10708	0.10776	0.10844	0.10912	0.10979	0.11046	0.11079	0.11145
60	0.11211	0.11276	0.11309	0.11374	0.11438	0.11502	0.11566	0.11598	0.11661	0.11724
70	0.11786	0.11849	0.11879	0.11941	0.12003	0.12064	0.12094	0.12155	0.12215	0.12275
80	0.12305	0.12365	0.12424	0.12483	0.12542	0.12571	0.12629	0.12687	0.12745	0.12774
90	0.12831	0.12888	0.12945	0.13002	0.13030	0.13087	0.13143	0.13198	0.13254	0.13282
100	0.13337	0.13392	0.13447	0.13501	0.13556	0.13583	0.13637	0.13690	0.13744	0.13797
110	0.13851	0.13904	0.13956	0.13983	0.14035	0.14087	0.14139	0.14191	0.14243	0.14295
120	0.14346	0.14397	0.14448	0.14499	0.14549	0.14600	0.14650	0.14700	0.14750	0.14800

EP 0 962 860 A1

FIG. 15B

130	0.14849	0.14899	0.14948	0.14997	0.15046	0.15095	0.15143	0.15192	0.15240	0.15288
140	0.15336	0.15408	0.15456	0.15503	0.15551	0.15598	0.15645	0.15715	0.15762	0.15808
150	0.15878	0.15924	0.15970	0.16016	0.16085	0.16131	0.16199	0.16244	0.16289	0.16357
160	0.16402	0.16469	0.16513	0.16580	0.16624	0.16690	0.16734	0.16800	0.16866	0.16909
170	0.16974	0.17039	0.17104	0.17147	0.17211	0.17275	0.17338	0.17402	0.17465	0.17507
180	0.17570	0.17633	0.17716	0.17778	0.17840	0.17902	0.17963	0.18024	0.18106	0.18166
190	0.18227	0.18308	0.18368	0.18447	0.18507	0.18586	0.18665	0.18724	0.18803	0.18881
200	0.18958	0.19036	0.19113	0.19190	0.19266	0.19342	0.19437	0.19512	0.19606	0.19681
210	0.19774	0.19867	0.19959	0.20051	0.20143	0.20252	0.20342	0.20450	0.20540	0.20647
220	0.20754	0.20860	0.20983	0.21087	0.21209	0.21330	0.21450	0.21587	0.21706	0.21858
230	0.21992	0.22142	0.22291	0.22438	0.22602	0.22780	0.22957	0.23148	0.23338	0.23557
240	0.23774	0.24005	0.24249	0.24520	0.24818	0.25142	0.25505	0.25919	0.26369	0.26921
250	0.27595	0.28434	0.29600	0.31512	0.35936	0.49100	0.85733			

FIG. 16

EXAMPLE OF DECLINATION DIVISION TABLE

(4 DIVISIONS)

DIVISION NUMBER	DIVISION BOUNDARY
0	0.8274
1	0.9079
2	0.9301
3	0.9486
4	1.0000

FIG. 17A

DIVISION 0	1	2	3	4	5	6	7	8	9
b=0, c=0									
0	+9.99999	+0.03142	+0.01968	+0.01436	+0.01008	+0.00750	+0.00536	+0.00355	+0.00220	+0.00100
10	+0.00010	-0.00089	-0.00164	-0.00233	-0.00298	-0.00347	-0.00404	-0.00447	-0.00498	-0.00537
20	-0.00574	-0.00609	-0.00643	-0.00675	-0.00706	-0.00736	-0.00764	-0.00792	-0.00812	-0.00838
30	-0.00857	-0.00881	-0.00904	-0.00921	-0.00938	-0.00959	-0.00975	-0.00996	-0.01010	-0.01025
40	-0.01039	-0.01058	-0.01071	-0.01084	-0.01097	-0.01110	-0.01122	-0.01139	-0.01150	-0.01162
50	-0.01173	-0.01185	-0.01196	-0.01206	-0.01217	-0.01227	-0.01237	-0.01247	-0.01257	-0.01267
60	-0.01276	-0.01286	-0.01292	-0.01301	-0.01310	-0.01319	-0.01327	-0.01336	-0.01344	-0.01352
70	-0.01360	-0.01368	-0.01376	-0.01381	-0.01389	-0.01397	-0.01404	-0.01411	-0.01418	-0.01426
80	-0.01433	-0.01439	-0.01446	-0.01453	-0.01457	-0.01464	-0.01470	-0.01477	-0.01483	-0.01489
90	-0.01496	-0.01502	-0.01508	-0.01514	-0.01519	-0.01525	-0.01531	-0.01536	-0.01542	-0.01547
100	-0.01553	-0.01558	-0.01564	-0.01569	-0.01574	-0.01579	-0.01584	-0.01589	-0.01594	-0.01599
110	-0.01604	-0.01609	-0.01613	-0.01618	-0.01623	-0.01627	-0.01633	-0.01638	-0.01642	-0.01646
120	-0.01651	-0.01656	-0.01661	-0.01665	-0.01669	-0.01673	-0.01678	-0.01682	-0.01686	-0.01692
130	-0.01695	-0.01699	-0.01704	-0.01708	-0.01712	-0.01717	-0.01720	-0.01725	-0.01729	-0.01733
140	-0.01737	-0.01741	-0.01745	-0.01749	-0.01753	-0.01757	-0.01761	-0.01766	-0.01769	-0.01773
150	-0.01777	-0.01780	-0.01784	-0.01788	-0.01792	-0.01796	-0.01800	-0.01804	-0.01808	-0.01812
160	-0.01816	-0.01819	-0.01823	-0.01827	-0.01830	-0.01835	-0.01838	-0.01842	-0.01846	-0.01849
170	-0.01854	-0.01857	-0.01861	-0.01864	-0.01868	-0.01872	-0.01875	-0.01879	-0.01883	-0.01887
180	-0.01891	-0.01894	-0.01898	-0.01902	-0.01906	-0.01909	-0.01913	-0.01917	-0.01920	-0.01924
190	-0.01928	-0.01932	-0.01936	-0.01939	-0.01943	-0.01947	-0.01951	-0.01955	-0.01958	-0.01962
200	-0.01966	-0.01970	-0.01974	-0.01978	-0.01982	-0.01986	-0.01990	-0.01994	-0.01998	-0.02002
210	-0.02006	-0.02010	-0.02015	-0.02019	-0.02023	-0.02027	-0.02032	-0.02036	-0.02040	-0.02045
220	-0.02049	-0.02054	-0.02059	-0.02063	-0.02068	-0.02073	-0.02078	-0.02083	-0.02088	-0.02094
230	-0.02099	-0.02104	-0.02110	-0.02116	-0.02121	-0.02128	-0.02134	-0.02140	-0.02147	-0.02154
240	-0.02161	-0.02169	-0.02177	-0.02185	-0.02194	-0.02204	-0.02215	-0.02227	-0.02241	-0.02256
250	-0.02275	-0.02299	-0.02334	-0.02401	-0.02527					

FIG. 17B

b=0, c=3

0	+9.99999	+0.04126	+0.03220	+0.02771	+0.02395	+0.02162	+0.01966	+0.01798	+0.01672	+0.01559
10	+0.01473	+0.01378	+0.01306	+0.01239	+0.01176	+0.01129	+0.01073	+0.01030	+0.00980	+0.00942
20	+0.00905	+0.00871	+0.00837	+0.00805	+0.00774	+0.00744	+0.00715	+0.00688	+0.00668	+0.00642
30	+0.00623	+0.00598	+0.00575	+0.00558	+0.00541	+0.00519	+0.00503	+0.00482	+0.00467	+0.00452
40	+0.00438	+0.00419	+0.00405	+0.00392	+0.00378	+0.00365	+0.00353	+0.00336	+0.00324	+0.00312
50	+0.00300	+0.00289	+0.00278	+0.00267	+0.00256	+0.00245	+0.00235	+0.00224	+0.00214	+0.00204
60	+0.00194	+0.00185	+0.00178	+0.00169	+0.00160	+0.00151	+0.00142	+0.00133	+0.00124	+0.00116
70	+0.00107	+0.00099	+0.00091	+0.00085	+0.00077	+0.00070	+0.00062	+0.00054	+0.00047	+0.00039
80	+0.00032	+0.00025	+0.00018	+0.00010	+0.00006	-0.00001	-0.00008	-0.00015	-0.00021	-0.00028
90	-0.00034	-0.00040	-0.00047	-0.00053	-0.00059	-0.00065	-0.00071	-0.00077	-0.00083	-0.00089
100	-0.00094	-0.00100	-0.00106	-0.00111	-0.00117	-0.00122	-0.00127	-0.00133	-0.00138	-0.00143
110	-0.00148	-0.00153	-0.00158	-0.00163	-0.00168	-0.00173	-0.00179	-0.00184	-0.00189	-0.00193
120	-0.00198	-0.00204	-0.00208	-0.00213	-0.00217	-0.00221	-0.00227	-0.00231	-0.00236	-0.00241
130	-0.00245	-0.00249	-0.00255	-0.00259	-0.00263	-0.00268	-0.00272	-0.00277	-0.00281	-0.00286
140	-0.00289	-0.00294	-0.00298	-0.00303	-0.00306	-0.00311	-0.00316	-0.00320	-0.00324	-0.00328
150	-0.00333	-0.00336	-0.00340	-0.00345	-0.00349	-0.00353	-0.00357	-0.00361	-0.00366	-0.00370
160	-0.00374	-0.00378	-0.00382	-0.00386	-0.00389	-0.00394	-0.00398	-0.00402	-0.00406	-0.00410
170	-0.00414	-0.00418	-0.00423	-0.00426	-0.00430	-0.00434	-0.00438	-0.00442	-0.00446	-0.00451
180	-0.00455	-0.00458	-0.00463	-0.00467	-0.00470	-0.00474	-0.00478	-0.00483	-0.00486	-0.00491
190	-0.00494	-0.00499	-0.00503	-0.00507	-0.00511	-0.00515	-0.00519	-0.00523	-0.00527	-0.00532
200	-0.00536	-0.00540	-0.00544	-0.00548	-0.00553	-0.00557	-0.00562	-0.00566	-0.00571	-0.00575
210	-0.00579	-0.00584	-0.00589	-0.00593	-0.00598	-0.00602	-0.00607	-0.00612	-0.00617	-0.00622
220	-0.00627	-0.00632	-0.00637	-0.00642	-0.00647	-0.00653	-0.00658	-0.00663	-0.00669	-0.00675
230	-0.00680	-0.00686	-0.00692	-0.00699	-0.00705	-0.00712	-0.00719	-0.00726	-0.00733	-0.00741
240	-0.00749	-0.00757	-0.00766	-0.00775	-0.00786	-0.00797	-0.00808	-0.00821	-0.00837	-0.00854
250	-0.00875	-0.00901	-0.00941	-0.01015	-0.01157					

FIG. 18A

DIVISION 0	1	2	3	4	5	6	7	8	9
b=0, c=0									
0 +9.99999	+0.03665	+0.03356	+0.03363	+0.03460	+0.03613	+9.99999	+9.99999	+9.99999	+9.99999
b=0, c=1									
0 +9.99999	+0.03869	+0.03581	+0.03588	+0.03678	+0.03821	+9.99999	+9.99999	+9.99999	+9.99999
b=0, c=2									
0 +9.99999	+0.04164	+0.03912	+0.03918	+0.03997	+0.04122	+9.99999	+9.99999	+9.99999	+9.99999
b=0, c=3									
0 +9.99999	+0.04476	+0.04275	+0.04280	+0.04344	+0.04444	+9.99999	+9.99999	+9.99999	+9.99999
b=1, c=0									
60 +9.99999	+9.99999	+9.99999	+0.11286	+0.11079	+0.10939	+0.10827	+0.10731	+0.10648	+0.10573
70 +0.10506	+0.10444	+0.10387	+0.10335	+0.10302	+0.10255	+0.10212	+0.10171	+0.10133	+0.10097
80 +0.10064	+0.10032	+0.10003	+0.09975	+0.09949	+0.09932	+0.09909	+0.09887	+0.09866	+0.09846
90 +0.09828	+0.09811	+0.09795	+0.09781	+0.09767	+0.09754	+0.09742	+0.09731	+0.09722	+0.09712
100 +0.09704	+0.09697	+0.09690	+0.09685	+0.09679	+0.09675	+0.09671	+0.09669	+0.09666	+0.09665
110 +0.09663	+0.09663	+0.09664	+0.09665	+0.09666	+0.09668	+0.09671	+0.09675	+0.09679	+0.09684
120 +0.09689	+0.09694	+0.09703	+0.09709	+0.09717	+0.09725	+0.09733	+0.09745	+0.09754	+0.09764
130 +0.09778	+0.09789	+0.09800	+0.09816	+0.09829	+0.09842	+0.09860	+0.09875	+0.09894	+0.09910
140 +0.09931	+0.09947	+0.09970	+0.09988	+0.10012	+0.10031	+0.10057	+0.10084	+0.10112	+0.10134
150 +0.10163	+0.10194	+0.10218	+0.10252	+0.10286	+0.10322	+0.10359	+0.10397	+0.10438	+0.10480
160 +0.10524	+0.10571	+0.10620	+0.10672	+0.10727	+0.10787	+0.10868	+0.10941	+0.11023	+0.11149
170 +0.11287	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999

FIG. 18B

b = 1, c = 1

60	+9.99999	+9.99999	+9.99999	+0.11816	+0.11626	+0.11497	+0.11394	+0.11306	+0.11229	+0.11160
70	+0.11098	+0.11040	+0.10987	+0.10939	+0.10908	+0.10865	+0.10824	+0.10786	+0.10751	+0.10718
80	+0.10686	+0.10657	+0.10629	+0.10604	+0.10579	+0.10564	+0.10542	+0.10521	+0.10502	+0.10483
90	+0.10466	+0.10450	+0.10436	+0.10422	+0.10409	+0.10397	+0.10386	+0.10376	+0.10366	+0.10358
100	+0.10350	+0.10343	+0.10337	+0.10332	+0.10327	+0.10323	+0.10320	+0.10317	+0.10315	+0.10313
110	+0.10312	+0.10312	+0.10312	+0.10313	+0.10315	+0.10317	+0.10319	+0.10323	+0.10327	+0.10331
120	+0.10336	+0.10341	+0.10349	+0.10355	+0.10362	+0.10369	+0.10377	+0.10388	+0.10397	+0.10406
130	+0.10419	+0.10430	+0.10440	+0.10455	+0.10467	+0.10479	+0.10496	+0.10510	+0.10528	+0.10543
140	+0.10562	+0.10578	+0.10599	+0.10616	+0.10638	+0.10656	+0.10680	+0.10705	+0.10731	+0.10752
150	+0.10779	+0.10808	+0.10831	+0.10861	+0.10893	+0.10927	+0.10961	+0.10997	+0.11034	+0.11074
160	+0.11115	+0.11158	+0.11203	+0.11251	+0.11302	+0.11357	+0.11432	+0.11499	+0.11575	+0.11690
170	+0.11817	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999

FIG. 18C

b=1, c=2

60	+9.99999	+9.99999	+9.99999	+0.12564	+0.12403	+0.12294	+0.12206	+0.12131	+0.12065	+0.12006
70	+0.11951	+0.11902	+0.11856	+0.11814	+0.11787	+0.11749	+0.11714	+0.11681	+0.11650	+0.11621
80	+0.11594	+0.11568	+0.11544	+0.11521	+0.11500	+0.11486	+0.11467	+0.11449	+0.11431	+0.11415
90	+0.11400	+0.11386	+0.11373	+0.11361	+0.11350	+0.11339	+0.11329	+0.11321	+0.11312	+0.11305
100	+0.11298	+0.11292	+0.11286	+0.11282	+0.11277	+0.11274	+0.11271	+0.11268	+0.11267	+0.11265
110	+0.11264	+0.11264	+0.11264	+0.11265	+0.11266	+0.11268	+0.11270	+0.11274	+0.11277	+0.11281
120	+0.11285	+0.11290	+0.11297	+0.11302	+0.11308	+0.11315	+0.11322	+0.11331	+0.11339	+0.11347
130	+0.11359	+0.11368	+0.11377	+0.11391	+0.11401	+0.11412	+0.11427	+0.11439	+0.11455	+0.11467
140	+0.11485	+0.11498	+0.11517	+0.11532	+0.11552	+0.11567	+0.11588	+0.11610	+0.11633	+0.11651
150	+0.11675	+0.11700	+0.11720	+0.11747	+0.11774	+0.11803	+0.11833	+0.11864	+0.11897	+0.11931
160	+0.11966	+0.12003	+0.12043	+0.12084	+0.12128	+0.12175	+0.12239	+0.12296	+0.12361	+0.12458
170	+0.12564	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999	+9.99999